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PLASMA GUN AND METHODS FOR THE USE THEREOF

Related Application

10 This application is a continuation-in-art of Application Serial no. 09/187,436
filed November 6, 1998 (the Parent Application, now U.S. Patent 6,084,198, issued July
4, 2000), which is a continuation-in-part of ^{application S.N. 08/847 434, filed 4/28/97, now} Patent No. 5,866,871 issued February 2, 1999
(the Parent Patent), the Parent Application and the Parent Patent being incorporated
herein by reference.

Field Of The Invention

15 This invention relates to plasma guns and more particularly to an improved
plasma gun suitable for use as a space thruster or to produce radiation at selectable
wavelengths, including extreme ultraviolet (EUV), vacuum ultraviolet (VUV) and/or soft
x-ray radiation at high pulse repetition frequency bands. The invention also involves
methods for utilizing such plasma guns.

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Background Of The Invention

As indicated in the Parent Application and the Parent Patent, the improved
plasma gun disclosed therein finds application in a variety of environments for
performing functions which either could not be performed previously, could not be
performed well previously, or could only be performed with relatively large and
25 expensive equipment. These functions include thrusters for satellite or other space
station keeping and maneuvering applications, and the controlled generation of radiation
at selected frequencies, generally within the extreme ultraviolet (EUV) band. The
plasma guns disclosed for such applications were particularly advantageous in that they
provided high reliability and pulse repetition frequency (PRF), and in particular a plasma
30 gun having a PRF in excess of approximately 100 Hz and preferably a PRF in excess of
5,000 Hz for space applications and PRFs of at least 500 Hz and preferably 1,000 Hz for
lithography or other applications requiring radiation generation.

In order to achieve these objectives, the plasma gun of the Parent
Application/Patent had two general embodiments, one for space applications or other
35 thruster applications, and a second embodiment for radiation generator applications. In
both cases, the plasma gun involved a center